

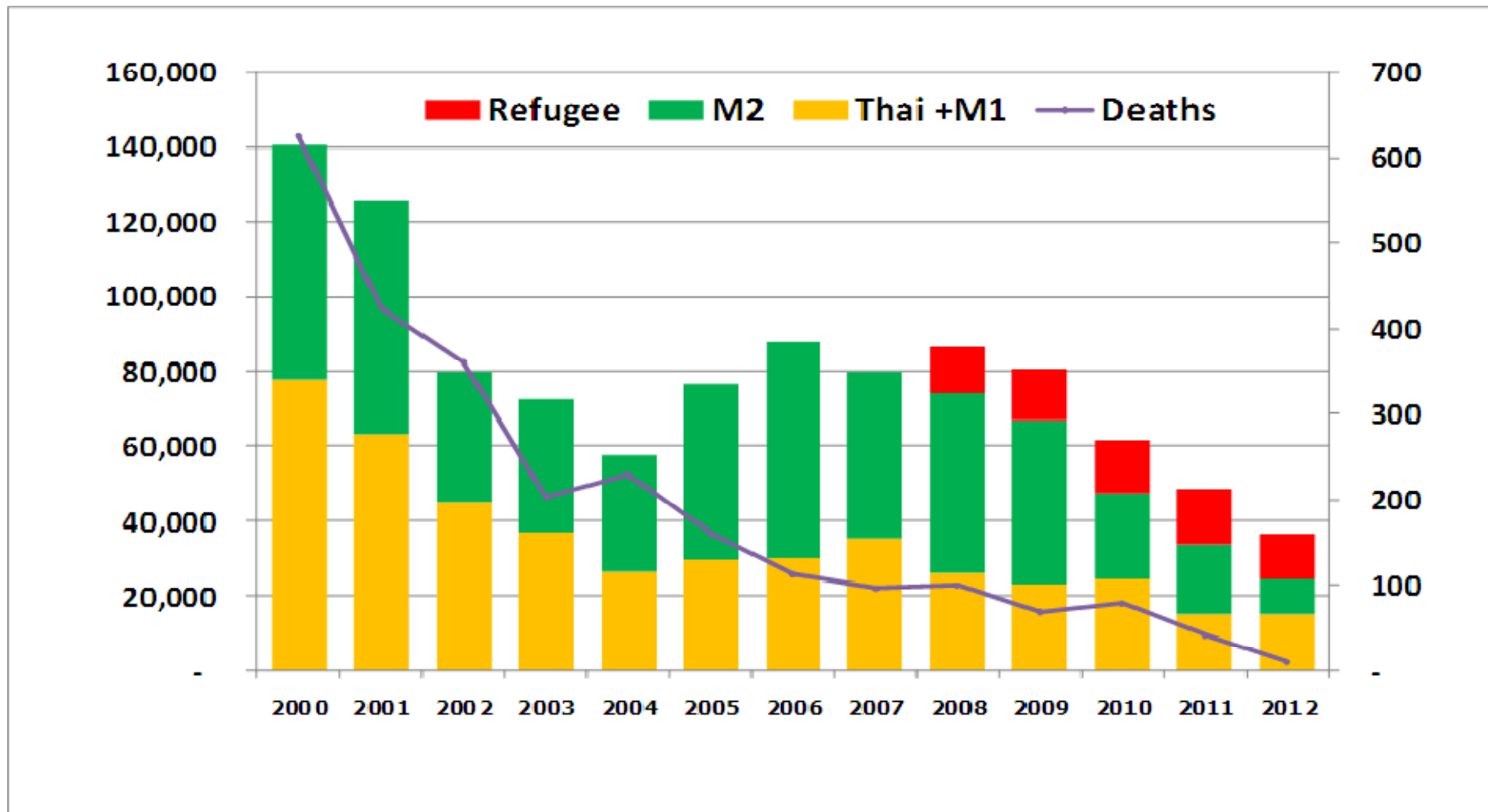


# **Factors influencing the misdiagnosis of microscopists in malaria clinics along the Thai-Myanmar and Thai-Cambodia border provinces**

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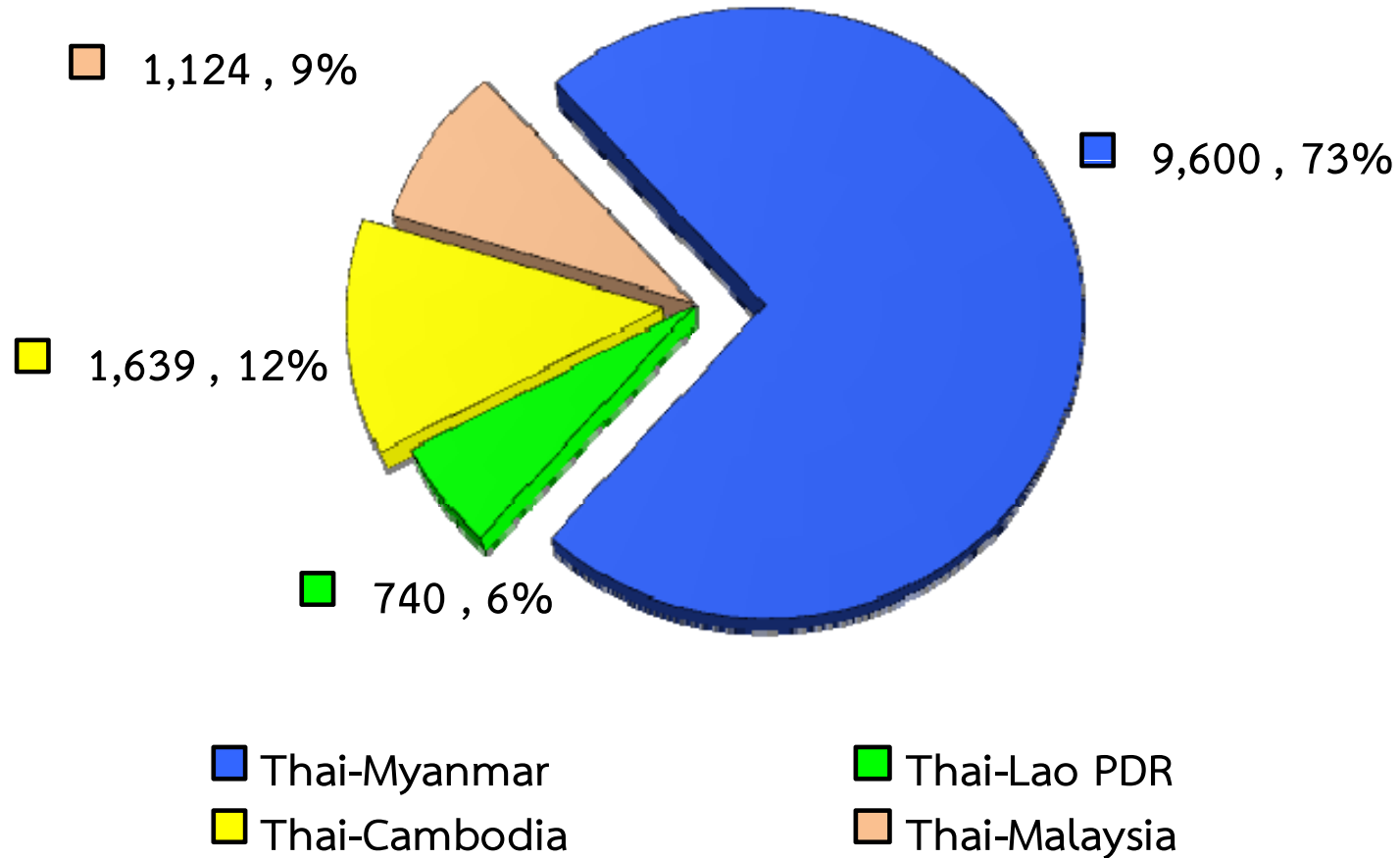


## Malaria Situation in Thailand, 2012





### Proportion of **Thai** cases by border sites, Thailand, 2012





## Background

- Routine malaria diagnosis technique in National Malaria Control and Elimination Program is now using microscopic technique as the Gold standard, examined by using blood film smear (thick and thin blood film) under microscope.
- All malaria cases are reported by laboratory confirmed cases which are carried out by microscopists who work in malaria clinics along the border areas.
- Quality control of blood film examination and Proficiency Testing process are regularly conducted to address the adequate performance and accreditation of microscopists.
- During 2008-2012, some of the microscopists gave gradually high percentage of slide reading error especially in malaria clinics along the border provinces.



## Research question

- Why sliding reading error rate of microscopist is high?
- What kind of factors affecting to the misdiagnosis of microscopists in malaria clinic?

## Objective

- To determine the factors influencing the misdiagnosis of microscopists in malaria clinics along the Thai-Myanmar and Thai-Cambodia border provinces.



## Definitions

### **Microscopist**

A person who work in malaria clinic under the National Malaria Control and Elimination Program and uses a microscope to read blood films to confirm the diagnosis of malaria and reports on their findings.

### **Misdiagnosis**

Microscopist can not read blood films correctly in terms of parasite detection, species and stages of parasite identification from the unknown slide (slide bank). The slide reading error rate must not exceed 10 percent

(Malaria microscopy quality assurance manual, version 1, WHO, 2008)

### **National Malaria Control and Elimination Program**

The countrywide permanent program responsible for all activities related to malaria prevention and control. These include integrated efforts with general health services to provide diagnosis and treatment for malaria.

# Methodology

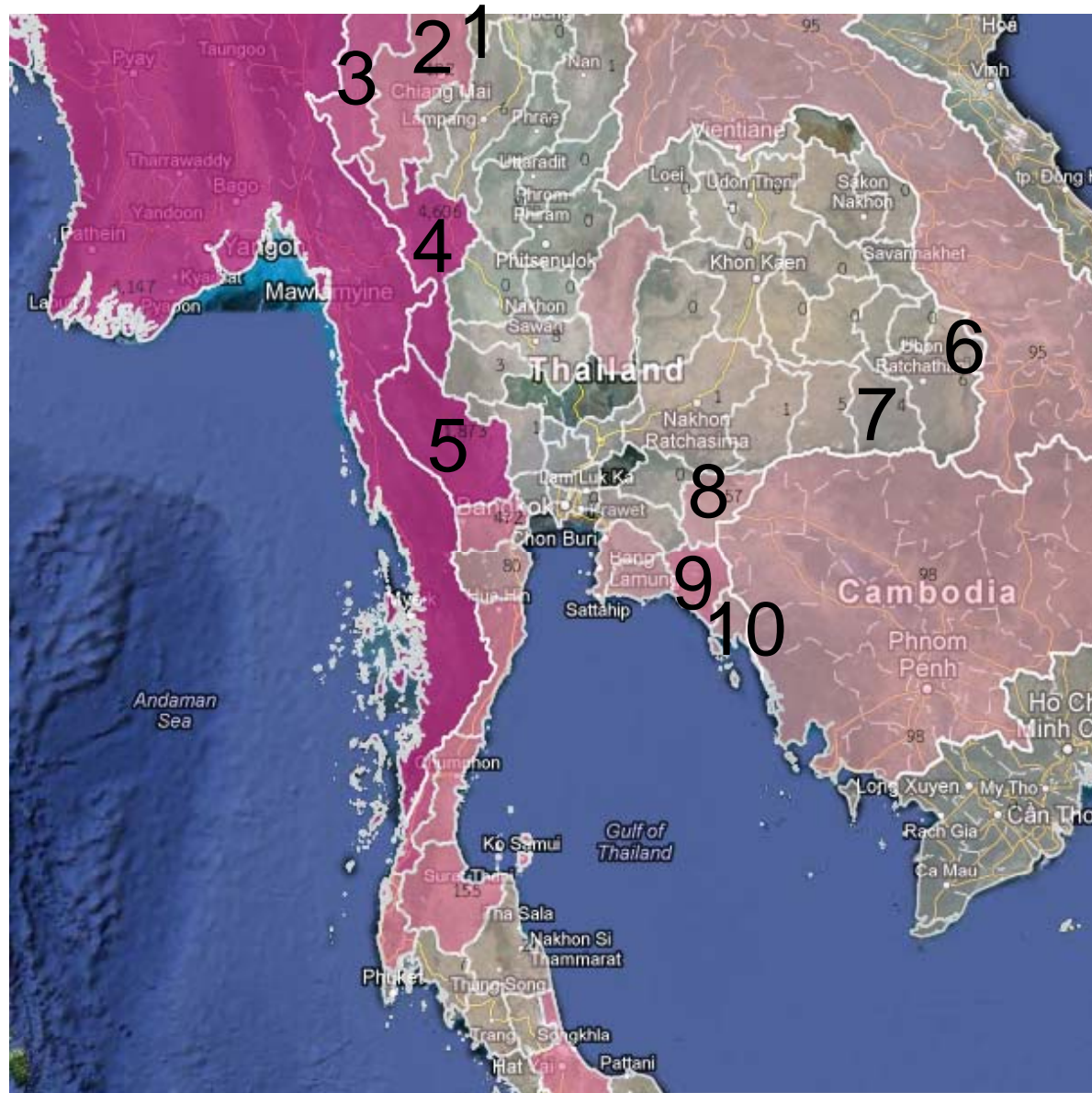
- Target population: No. of 164 microscopists (139 male and 25 female) were selected by using random sampling technique.
- Study design: Cross sectional study
- Study sites: 10 border provinces
- Data collection: Questionnaires, questions with multiple choices and 10 unknown blood slide examination were tested for determining malaria knowledge and slide readings skill of the microscopists.
- Data analysis: Descriptive statistics: mean, SD (age, gender, SES, medical history, knowledge, attitude and practice, etc.)  
: Analytical statistics: Logistic Regression (the association of the factors and slide reading error rate)



## Study Sites

Thai-Myanmar border provinces

1. Chaingrai
2. Chaingmai
3. Mae Hong son
4. Tak
5. Kanchanaburi



## Study Sites

Thai-Cambodia border provinces

6. Ubonratchathani
7. Surin
8. Sakaew
9. Chanthaburi
10. Trad





## Results

- There was no significantly difference between the two border sites (Thai-Myanmar and Thai-Cambodia Border provinces) in terms of the malaria basic knowledge and the sliding reading error rate of microscopists.
- Female microscopists, old age, having family member with color blindness and have been trained for the training course on malaria microscopy more than 5 years gave the high percentage of the slide reading error in malaria diagnosis.
- All microscopists also gave high percentage of malaria knowledge and high positively attitude for working in malaria clinics along the two border sites.
- The percentage of the sliding reading error rate in diagnosis was 4.82 and false positive was 0.24 whereas the percentage of false negative was zero.



## Misdiagnosis of parasite species and stages of parasite

Slide reading error	Microscopists (n=164)		No. of Slide (n=1,640)	
	Number	%	Number	%
<b>Parasites species</b>				
All correct	107	65.24	1,561	95.18
Slide reading error	57	34.76	79	4.82
<b>False Positive</b>	4	2.44	4	0.24
<b>False Negative</b>	0	0	0	0
<b>Stages of parasites</b>				
All correct	97	59.51	1,466	89.94
Slide reading error	66	40.49	164	10.06



## Discussion and Conclusion

- There was the homogenously basic knowledge on malaria with the same standard and protocol of the training course on malaria microscopy among the two border sites.
- Although there was no significantly difference between the factors and misdiagnosis (age, gender, education level, trained experiences, medical history, color blindness history etc.) but the results have shown some problems of slide reading error which should be concerned.
- The result of this study may gave considerably helpful for regularly conducting the refreshment course on malaria microscopy which was found to be necessary and urgently need to be conducted especially in the border provinces where the occurrence of malaria transmission was still high.

## Recommendations

- Regular re-training and assessment or grading of competency, supported by a well validated reference slide set (slide bank) is necessarily done.
- Refreshment course (or re-training) urgently need to be conducted and prioritized by the malaria clinic where the high percentage of slide reading error and low proficiency testing are found.
- Regular visit for supervision, monitoring and evaluation need to be done at all level.
- Supervisors must give a good feedback to address the inadequate performance of microscopists.
- An adequate budget is required as an essential part of funding for malaria case management and training especially trained in malaria microscopy.
- Testing for color blindness should be considered prior to be trained on malaria microscopy.

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THANK YOU  
FOR YOUR ATTENTION

